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times its original size, the chromatin remaining in one place, while the rest of the nuclear cavity is occupied only by the sap. A complete series of measurements shows that the chromatin area has not diminished. Although there is no contraction, important changes take place in the chromatin during synapsis. There is some evidence that the reticulum of the resting nucleus is composed of a number of threads, and that this number corresponds to the diploid number of chromosomes. Further, the threads are double and there is no evidence of any blending or fusion, the actual reduction occurring much later than the period known as synapsis. A paper dealing with the details of reduction is to follow.—CHARLES J. CHAMBERLAIN.

Turgescence and respiration.—MAIGE and NICOLAS[22] have performed some very interesting experiments upon the effect of turgescence upon respiration. The materials used were various buds, leaves, and embryos. The gas determinations were made by the Bonnier-Mangin method. The work is reported under three heads: effect of increase of turgescence, effect of decrease of turgescence, and effect of a decrease followed by an increase. A rise in turgescence is always followed by increased production of CO_2, intake of O_2, and an increase in the ratio CO_2/O_2. A fall in turgescence produces similar but less marked effects in material taken directly from the plant or soaked for a period in 5 per cent sucrose. In material previously soaked in 10 or 20 per cent glucose, this treatment always gives a decrease in CO_2, O_2, and frequently in the CO_2/O_2. Each change, in the decrease followed by the increase, generally gave an increase in CO_2, O_2, and CO_2/O_2. These facts are new and most interesting, but the interpretations will not find universal acceptance. The authors believe that increased turgescence increases respiration by increasing growth; and decreased turgescence by concentrating the oxidizable solutes of the cell. The first stimulative effect they consider the greater. The authors postulate an optimum concentration for the oxidizable solutes of the cell, and attribute the reversal of behavior after treatment with the strong glucose solutions to this optimum being passed.—WILLIAM CROCKER.

New mesozoic plants.—JEFFREY[23] has described a new araucarian genus (*Woodworthia arizonica*) from a triassic forest of Arizona. The wood is of the *Araucarioxylon* type, but the short shoots are abietineous, and persisted in the wood of the trunk throughout the life of the tree. It is suggested that short shoots characterized the older coniferous stock, and that this would fit into the current explanation of the coniferous ovuliferous scale as a modified short shoot. The leaf traces did not persist in the secondary wood, as they do among the living araucarians, but JEFFREY does not regard persistent leaf traces as an ancestral character of the coniferous stock, as SEWARD and LIGNIER have claimed, but as a more recently acquired character. The testimony of *Wood-*

[22] MAIGE, A., et NICOLAS, G., Recherches sur l'influence des variations de la turgescence sur la respiration de la cellule. Rev. Gén. Botanique **22**:409–422. 1910.

[23] JEFFREY, E. C., A new araucarian genus from the Triassic. Proc. Boston Soc. Nat. Hist. **34**:325–332. *pls. 31, 32.* 1910.

worthia is thought to strengthen the evidence of the approximation of Araucarineae and Abietineae in the early Mesozoic, and of the more primitive character of the latter.

The same investigator[24] has also published a new species of *Prepinus* from the Cretaceous of Martha's Vineyard, which differs from the type species of Staten Island in that the wood of the short shoots has numerous resin canals in two or more rows, and the pith is without sclerotic nests. The conclusion is reached that "ligneous resin canals" are features of the oldest Abietineae, as shown now by the structure of the archaic genus *Prepinus* and also by that of the oldest species of *Pityoxylon*.—J. M. C.

Chlorophyll and photosynthesis.—IRVING,[25] working in BLACKMAN'S laboratory, has studied the relation between the early development of chlorophyll and of the photosynethetic power. He finds that seedlings developing in darkness and later transferred to light, or developing from the first in light, are able to fix all CO_2 produced by respiration only after becoming almost fully green. When considerable photosynthetic power does appear, it develops rapidly. The author believes the photosynthetic activity up to this stage never fixes more than 10 per cent of the CO_2 produced by respiration, and never amounts to over 1 per cent of the activity after the full development of the chlorophyll. The following quotation from the summary shows the significance of the work: "We are forced to conclude that the first development of this function is not in any relation to the amount of chlorophyll produced, and that the amount of chlorophyll present is never a limiting factor to assimilation in these early stages of the assimilating organs. If this is so, then it must be some other component part of the photosynthetic machinery which controls the beginning of complete functional activity. This part is not developed by illumination so quickly as the green pigment is developed, and therefore the pigment, and other parts of the total machinery, lie idle at the stage we have examined, awaiting the developing of the last factor."—WILLIAM CROCKER.

Reduction divisions of Oenothera.—DAVIS[26] has published another confirmation of the earlier work of GATES[27] and of GEERTS[28] on reduction in

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24 JEFFREY, E. C., A new *Prepinus* from Martha's Vineyard. Proc. Boston Soc. Nat. Hist. **34**:333–338. *pl. 33.* 1910.

25 IRVING, A. A., The beginning of photosynthesis and the development of chlorophyll. Annals of Botany **24**:805–818. 1910.

26 DAVIS, B. M., The reduction divisions of *Oenothera biennis*. Annals of Botany **24**:631–651. *pls. 52, 53.* 1910.

27 GATES, R. R., Pollen development in hybrids of *Oenothera lata*×*O. Lamarckiana*, and its relation to mutation. BOT. GAZETTE **43**:81–115. *pls. 2–4.* 1907.

———, A study of reduction in *Oenothera rubrinervis*. BOT. GAZETTE **46**:1–34. *pls. 1–3.* 1908.

———, The behavior of the chromosomes in *Oenothera lata*×*O. gigas*. BOT. GAZETTE **48**:179–199. *pls. 12–14.* 1909.

28 GEERTS, J. M., Beiträge zur Kenntnis der Cytologie und der partiellen Sterilität von *Oenothera Lamarckiana*. Recueil Trav. Bot. Néerl. **5**:93–208. 1909.